

Claims

- [c1] An apparatus for producing nonsymmetrical three dimensional food products comprising:
- an iris diaphragm for shaping and portioning food product fed therethrough;
 - a food pump for feeding food product to the iris diaphragm;
 - a gearbox having a plurality of gears connected to the iris diaphragm for opening and closing said diaphragm to the feed of food product;
 - a motor connected to the gearbox to drive the gears in the gearbox;
 - a vector drive controlling the motor; and,
 - an encoder providing signals to the vector drive directing the operation of the motor to shape the food product exiting from the iris diaphragm.
- [c2] An apparatus for producing nonsymmetrical three dimensional food products in accordance with Claim 1 further including:
- a plurality of iris diaphragms coupled to the gearbox to function simultaneously shaping and portioning food product.
- [c3] An apparatus for producing nonsymmetrical three dimensional food products in accordance with Claim 1 wherein:
- the motor comprises an induction motor, which may be controlled to start, stop, speed up, slow down and reverse during a single pumping operation to provide a predetermined shape from the iris diaphragm.
- [c4] An apparatus for producing nonsymmetrical three dimensional food products in accordance with Claim 1 wherein:
- the iris diaphragm comprises a plurality of moveable blades arranged in a shutter like configuration to provide an opening for food product, a blade drive ring connected to the blades to open and close the blades about said opening in a predetermined sequence related to the product being formed, a drive lever having one end connected to the drive ring and the other end connected to the gear box; and,
 - a flip cutter mounted adjacent the iris opening to flip off the shaped food product at the end of a portion.
- [c5] An apparatus for producing nonsymmetrical three dimensional food products

comprising:

an iris diaphragm for shaping and portioning food product fed therethrough;
a food pump for feeding food product to the iris diaphragm;
a gearbox having a plurality of gears connected to the iris diaphragm for opening and closing said diaphragm to the feed of food product;
a motor connected to the gearbox to drive the gears in the gearbox;
a servo device controlling the motor; and,
an encoder providing signals to the servo drive directing the operation of the motor to shape the food product exiting from the iris diaphragm.

[c6] An apparatus for producing nonsymmetrical three dimensional food products in accordance with Claim 5 wherein:
the motor comprises a synchronous motor.

[c7] The method of producing nonsymmetrical three dimensional food products comprising:
providing a diaphragm to open and close in a predetermined manner to provide a shaped food product;
pumping a food product through the diaphragm when open; and,
actuating the diaphragm and controlling the movement of the diaphragm to open and close on the flow of food product to shape said product.

[c8] The method of producing nonsymmetrical three dimensional food products in accordance with Claim 7 further providing:
encoder instructions to control the diaphragm movement to produce a predetermined nonsymmetrical three-dimensional food product.

[c9] The method of producing nonsymmetrical three dimensional food products in accordance with Claim 8 wherein:
a plurality of diaphragms is provided, each actuated and controlled to simultaneously open and close on the flow of food product to shape said product.

[c10] The method of producing nonsymmetrical three dimensional food products in accordance with Claim 8 further comprising the steps of:

providing a motor to actuate the diaphragm; and,
using flux control to maintain predetermined motor positioning.

[c11] The method of producing nonsymmetrical three dimensional food products in accordance with Claim 8 including:
using voltage control to maintain motor positioning of the diaphragm movement to produce a predetermined nonsymmetrical three dimensional food product.

[c12] An apparatus for producing nonsymmetrical three dimensional food products in accordance with Claims 1 and 5 where:
the food products comprise products such as chicken drummies, fish and torpedoes.